The Intersection of Artificial Intelligence, National Security, and Geopolitical Competition

Authors: Folorunsho Adeola [1], Elevane Dave [2]

Email: folorunshoadeola47@gmail.com [1]
elevanemarketyn@gmail.com [2]

ABSTRACT

Artificial intelligence (AI) has emerged as a transformative force in shaping modern national security systems and intensifying geopolitical competition among global powers. Its integration into military operations, intelligence gathering, cybersecurity frameworks, and strategic defense planning is redefining how states perceive, predict, and respond to threats. AI technologies enable enhanced surveillance capabilities, rapid data analysis, autonomous decision-support systems, and advanced cyber defense mechanisms, thereby strengthening state security apparatuses and operational efficiency. At the same time, the increasing militarization of AI has contributed to a new form of global rivalry, where technological superiority is closely tied to economic influence and strategic dominance. Leading powers are investing heavily in AI research and defense applications, accelerating an international competition often described as an AI arms race. However, the growing reliance on AI in national security also introduces significant risks and challenges. These include ethical concerns surrounding autonomous weapon systems, the potential for escalation in conflict scenarios, cybersecurity vulnerabilities, and the lack of clear international regulatory frameworks. Additionally, disparities in AI development between advanced and developing nations raise concerns about global inequality and shifting power balances in international relations. This paper examines the intersection of artificial intelligence, national security, and geopolitical competition, analyzing how AI reshapes global security structures, influences strategic decision-making, and alters the dynamics of international power relations.

Keywords

Artificial intelligence; National security; Geopolitical competition; Military AI; Cybersecurity; Autonomous weapons systems; Intelligence analysis; Global power rivalry; Defense innovation; Strategic technology.

1. INTRODUCTION

Artificial intelligence (AI) has rapidly evolved into one of the most strategically significant technologies shaping contemporary international relations and national security frameworks. Once primarily associated with commercial innovation and academic research, AI is now deeply embedded in defense systems, intelligence operations, cybersecurity infrastructures, and state-level strategic planning. This shift reflects a broader transformation in global power structures, where technological capability particularly in AI has become a central determinant of national strength, military readiness, and geopolitical influence. In modern security environments, AI is no longer considered a supplementary tool but a core component of defense modernization. States are deploying AI systems for a wide range of security functions, including real-time threat detection, surveillance automation, autonomous reconnaissance, predictive intelligence analysis, and cyber defense operations. These systems enable faster decision-making, improved situational awareness, and enhanced operational efficiency, thereby reshaping traditional military doctrines and security strategies.

At the same time, AI introduces complex challenges to national security governance. Unlike conventional technologies, AI systems rely heavily on data-driven algorithms that continuously learn and adapt, which can introduce unpredictability in high-stakes environments. Concerns such as system vulnerability to cyberattacks, algorithmic errors in decision-making, and lack of transparency in autonomous processes raise critical questions about reliability and control in defense applications. These risks become particularly significant when AI is integrated into weapons systems or real-time combat decision frameworks. The geopolitical dimension of AI is equally significant. Major global powers, including the United States, China, and the European Union, are heavily investing in AI research and development as part of broader national strategies to secure technological leadership. This competition extends beyond military applications into economic dominance, data infrastructure control, and global standards setting for AI governance. As a result, AI has become a defining feature of modern geopolitical rivalry, often described as a new form of technological arms race.

Furthermore, disparities in AI capabilities between developed and developing countries are reshaping global power hierarchies. Nations with advanced AI infrastructure are gaining strategic advantages in intelligence, defense, and economic influence, while less developed states risk increased dependency on foreign technologies. This imbalance raises concerns about sovereignty, digital inequality, and long-term shifts in international power distribution. Therefore, understanding the intersection of artificial intelligence, national security, and geopolitical competition is essential for analyzing the evolving structure of global politics. This paper examines how AI is transforming defense systems, reshaping international power dynamics, and redefining the nature of security and competition in the twenty-first century.

2. AI IN MODERN NATIONAL SECURITY SYSTEMS

Artificial intelligence has become deeply embedded in modern national security systems, fundamentally transforming how states perceive threats, collect intelligence, and execute defense operations. Rather than functioning as a supplementary technology, AI now operates as a core infrastructural component of security architectures, influencing both strategic-level decision-making and tactical-level operational responses. This transformation reflects a broader shift from traditional human-centered security models to hybrid systems in which human judgment is increasingly augmented or partially replaced by algorithmic intelligence.

A major area of AI application in national security is intelligence collection, processing, and analysis. Modern intelligence ecosystems generate enormous volumes of heterogeneous data, including satellite imagery, intercepted communications, radar signals, social media content, and open-source intelligence (OSINT). Traditionally, human analysts were responsible for synthesizing this information, a process that is both time-consuming and prone to cognitive limitations. AI significantly enhances this process through machine learning algorithms, deep learning models, and natural language processing (NLP) systems that can rapidly classify, translate, and analyze large datasets. These systems can identify hidden correlations, detect anomalies, and generate predictive insights that support threat assessment. For instance, AI-powered pattern recognition tools can detect unusual communication patterns that may indicate coordinated security threats or emerging geopolitical risks.

In addition to intelligence processing, AI has revolutionized surveillance and reconnaissance capabilities. Computer vision systems integrated into satellite imaging, drones, and ground-based sensors enable continuous monitoring of strategic locations, border regions, and urban environments. These systems can automatically detect suspicious movements, identify objects of interest, and track behavioral patterns over time. In military contexts, AI-enhanced surveillance reduces dependence on manual monitoring and increases situational awareness across vast and complex operational environments. However, this increased surveillance capability also raises concerns about mass monitoring, civil liberties, and the balance between security and privacy in state governance.

Cybersecurity represents another critical domain where AI plays a central role in national defense. As states become increasingly dependent on digital infrastructure, cyber threats have evolved into a major national security concern. AI-driven cybersecurity systems are designed to detect, prevent, and respond to cyberattacks in real time. These systems analyze network traffic patterns, identify deviations from normal behavior, and predict potential vulnerabilities before they are exploited. Unlike traditional rule-based security systems, AI models continuously learn from new attack patterns, enabling adaptive defense mechanisms against evolving cyber threats such as ransomware, phishing campaigns, and advanced persistent threats (APTs). Some systems are even capable of automated incident response, isolating compromised networks or neutralizing malicious activity without human intervention. While this improves response speed, it also introduces risks if automated systems misclassify legitimate activity as hostile or fail to interpret complex attack vectors correctly.

Another increasingly important application is the development of autonomous military systems. AI technologies are being integrated into unmanned aerial vehicles (UAVs), autonomous ground combat systems, missile guidance systems, and naval defense platforms. These systems can operate with varying degrees of autonomy, ranging from human-in-the-loop models (where humans approve actions) to fully autonomous systems capable of executing missions independently. The strategic advantage of such systems lies in their ability to reduce human risk, increase operational speed, and function in environments that may be too dangerous or inaccessible for human soldiers. However, the deployment of autonomous weapons systems raises profound ethical and legal questions, particularly regarding accountability in the event of unintended harm or misidentification of targets.

AI also plays a growing role in command, control, communications, computers, intelligence, surveillance, and reconnaissance (C4ISR) systems. Within these integrated defense frameworks, AI assists military leaders in processing battlefield data, simulating conflict scenarios, and optimizing resource allocation. Predictive analytics and simulation models allow defense planners to evaluate multiple strategic outcomes, assess enemy behavior patterns, and adjust operational strategies in real time. This capability enhances decision superiority, enabling states to act faster and more precisely than adversaries in dynamic conflict environments. Furthermore, AI contributes to early warning systems for national security threats. By analyzing geopolitical data, economic indicators, social media trends, and intelligence reports, AI systems can identify early signs of instability, potential conflicts, or terrorist activities. These predictive capabilities allow governments to adopt preventive security measures rather than reactive responses, fundamentally shifting the logic of national defense toward anticipatory governance.

Despite these advantages, the integration of AI into national security systems introduces significant risks. Issues such as algorithmic bias, system vulnerability to cyber manipulation, lack of transparency in decision-making processes, and over-reliance on automated systems all pose challenges to effective governance. In high-stakes military environments, even minor errors in AI interpretation can lead to severe strategic or humanitarian consequences. Additionally, the opacity of many advanced AI models complicates oversight and accountability, making it difficult to determine how specific decisions are reached. Overall, AI has become a transformative force in modern national security systems, enhancing intelligence capabilities, strengthening cybersecurity, enabling autonomous defense operations, and improving strategic decision-making. However, these advancements also create new layers of complexity that require robust governance, ethical safeguards, and careful integration to ensure that technological superiority does not compromise stability, accountability, or international security norms.

3. ARTIFICIAL INTELLIGENCE AND GEOPOLITICAL COMPETITION

Artificial intelligence has become a defining driver of contemporary geopolitical competition, reshaping how states compete for power, influence, and strategic advantage in the international system. Unlike earlier eras of competition centered on industrial capacity, nuclear capability, or energy resources, the current global order is increasingly shaped by technological dominance particularly in AI research, infrastructure, and deployment. As a result, AI is now widely regarded as a foundational "general-purpose technology" with implications comparable to electricity or the internet, but with far more direct influence on security and military capability. At the core of this competition is the pursuit of technological superiority among major global powers. Countries such as the United States, China, and leading members of the European Union are investing heavily in AI research, talent development, and large-scale computing infrastructure. These investments are not solely motivated by economic growth but also by strategic considerations, as AI capability is increasingly linked to military readiness, intelligence superiority, and cyber dominance. In this context, AI development has become a central component of national security strategy and foreign policy planning.

This competition is often described as a new form of technological arms race. However, unlike traditional arms races that focused on physical weapon systems, the AI competition extends across multiple domains, including data access, semiconductor production, cloud computing infrastructure, and algorithmic innovation. Control over these enabling technologies has become strategically important, as they determine a state's ability to develop advanced AI systems. Consequently, supply chain control particularly in areas such as microchips and high-performance computing hardware has become a critical geopolitical battleground. Another key dimension of AI-driven geopolitical competition is the struggle over global standards and governance frameworks. States are not only competing to develop advanced AI systems but also to shape international norms governing their use. This includes regulations related to autonomous weapons, data privacy, cybersecurity protocols, and ethical AI development. The ability to influence global AI standards provides states with long-term strategic advantages, as it allows them to shape how other countries develop and deploy similar technologies.

In addition to direct state competition, AI has intensified power asymmetries between technologically advanced and developing nations. Countries with limited access to AI infrastructure face increasing dependence on foreign technologies, cloud services, and external expertise. This dependency can reduce strategic autonomy and expose weaker states to external influence in both economic and security domains. As a result, AI is contributing to a widening digital and geopolitical divide in the international system. Furthermore, AI plays a central role in hybrid and information warfare, where states compete through non-traditional means such as cyber operations, disinformation campaigns, and algorithmically amplified influence strategies. Social media platforms and digital ecosystems powered by AI algorithms can be used to shape public opinion, destabilize political systems, and influence electoral processes in rival states. This form of competition blurs the line between peace and conflict, creating persistent low-intensity geopolitical tensions.

Strategically, AI also enhances deterrence capabilities. States with advanced AI-driven military systems, intelligence networks, and cybersecurity defenses are better positioned to deter adversaries through perceived technological superiority. However, this can also increase instability if rival states perceive AI advancements as threatening, potentially leading to escalation cycles driven by mistrust and uncertainty. Overall, AI-driven geopolitical competition represents a structural transformation in global power dynamics. It extends beyond traditional military rivalry into economic systems, technological ecosystems, and informational domains. As states continue to invest in AI capabilities, the international system is likely to experience intensified competition, shifting alliances, and evolving norms governing the use of emerging technologies in security and warfare.

4. AI, AUTONOMOUS WEAPONS, AND THE ETHICS OF MODERN WARFARE

One of the most controversial dimensions of artificial intelligence in national security is its application in autonomous weapons systems and modern warfare. These systems, often referred to as lethal autonomous weapon systems (LAWS), are capable of selecting and engaging targets with minimal or no human intervention. Their development represents a significant shift in military doctrine, moving from human-controlled engagement toward machine-assisted or fully automated combat operations. This transition raises profound strategic, ethical, and legal questions for international security. From a military perspective, autonomous systems provide significant operational advantages. AI-enabled drones, robotic combat units, and automated surveillance weapons can operate in environments that are dangerous, inaccessible, or too complex for human soldiers. They can process battlefield data in real time, identify targets with high-speed precision, and execute coordinated operations across multiple domains. This enhances response time, reduces human casualties, and increases operational efficiency in high-intensity conflict scenarios. In modern warfare, speed of decision-making has become a critical factor, and AI systems are capable of outperforming human cognitive limits in certain tactical situations.

However, the delegation of lethal decision-making to machines introduces serious ethical concerns. A central issue is accountability: if an autonomous system incorrectly identifies a target or causes unintended civilian harm, it becomes difficult to determine responsibility. Unlike traditional military operations, where command structures clearly assign responsibility to human actors, autonomous systems distribute decision-making across software developers, military commanders, and algorithmic processes. This creates an accountability gap that challenges existing frameworks of international humanitarian law. Another major ethical concern is the issue of proportionality and discrimination in warfare. International humanitarian law requires combatants to distinguish between military targets and civilians and to ensure that the use of force is proportionate to the military objective. While AI systems can be trained to recognize patterns and classify objects, they may still struggle with contextual judgment in complex environments such as urban warfare. This limitation

raises concerns about whether autonomous systems can reliably comply with humanitarian principles under unpredictable battlefield conditions.

The proliferation of autonomous weapons also has significant implications for global security stability. As more states develop and deploy AI-driven military systems, the risk of an arms race in autonomous warfare increases. This competition could lower the threshold for entering conflict, as states may perceive reduced human cost in deploying machine-operated systems. In turn, this may increase the frequency or intensity of military engagements, particularly in regions with existing geopolitical tensions. Cyber vulnerability further complicates the deployment of autonomous weapons. AI-driven military systems rely heavily on data networks, communication channels, and software infrastructure, all of which may be susceptible to hacking, spoofing, or adversarial manipulation. If compromised, autonomous systems could be misdirected or disabled, potentially escalating conflicts or causing unintended damage. This introduces a new layer of risk in modern warfare, where digital vulnerabilities can have physical and lethal consequences.

Despite these challenges, some policymakers and defense strategists argue that autonomous systems can improve compliance with ethical standards by reducing human emotional bias, fatigue, and impulsive decision-making in combat situations. However, this argument remains contested, as the lack of human judgment in complex moral situations continues to be a major concern. Overall, the integration of AI into warfare represents a fundamental transformation in military ethics and global security architecture. While autonomous weapons offer strategic advantages in speed, precision, and operational capability, they also raise critical questions about accountability, legality, and moral responsibility in armed conflict. The future of warfare will likely depend on how the international community addresses these challenges through regulation, governance, and technological safeguards.

5. CYBERSECURITY, INFORMATION WARFARE, AND STRATEGIC INFLUENCE

Artificial intelligence has become a central instrument in modern cybersecurity and information warfare, significantly expanding the scope of national security beyond traditional military domains. In the digital age, state security is no longer defined solely by territorial defense but also by the protection of information systems, communication networks, and critical infrastructure. AI enhances these capabilities by enabling faster threat detection, automated response mechanisms, and large-scale analysis of cyber activities in real time. In cybersecurity, AI systems are widely deployed to identify, predict, and neutralize cyber threats. These systems analyze network traffic patterns, detect anomalies, and identify malicious behavior that may indicate cyber intrusions or coordinated attacks. Unlike conventional security tools that rely on predefined rules, AI-driven cybersecurity models use machine learning to adapt to evolving threat landscapes. This allows them to detect previously unknown

forms of malware, phishing attacks, and advanced persistent threats (APTs). As cyberattacks become more sophisticated, AI has become essential for maintaining national digital resilience and protecting critical infrastructure such as power grids, financial systems, and communication networks.

However, the same AI technologies used for defense can also be exploited for offensive cyber operations. State and non-state actors can deploy AI to automate hacking attempts, identify system vulnerabilities, and scale cyberattacks with greater efficiency. This creates an increasingly complex cyber threat environment in which both defense and offense are enhanced by intelligent systems. As a result, cybersecurity has become a continuous, adaptive competition between attackers and defenders operating at machine speed. Beyond cybersecurity, AI plays a major role in information warfare, where states seek to influence public opinion, political stability, and social cohesion in rival countries. AI-driven algorithms on social media platforms can be used to amplify specific narratives, target vulnerable populations, and spread disinformation at scale. These systems are capable of micro-targeting individuals based on behavioral data, making influence operations more precise and difficult to detect. Consequently, information warfare has evolved into a highly sophisticated domain where perception management is as important as physical military strength.

Deep learning models and generative AI technologies further intensify this challenge by enabling the creation of highly realistic synthetic content, including deepfakes, automated propaganda, and fabricated news narratives. Such content can be used to manipulate political discourse, undermine trust in institutions, and destabilize democratic processes. The speed and scale at which AI-generated misinformation can spread pose significant risks to public trust and national stability. In addition, AI contributes to strategic influence operations that extend beyond digital platforms. States use data analytics and predictive modeling to understand social behavior, anticipate political movements, and design targeted communication strategies. These capabilities allow governments and strategic actors to shape narratives in ways that align with their geopolitical interests. In some cases, this can blur the boundary between legitimate public diplomacy and covert influence operations.

The convergence of AI, cybersecurity, and information warfare has also led to increased geopolitical tension. States accuse one another of conducting AI-assisted cyber espionage and digital interference in domestic affairs. This has created a persistent state of low-intensity conflict in cyberspace, where attribution is difficult and retaliation is often indirect or asymmetrical. Overall, AI has fundamentally transformed cybersecurity and information warfare into central components of national security strategy. While it enhances defensive capabilities and improves threat detection, it also amplifies offensive cyber potential and increases the complexity of global information ecosystems. Managing these risks requires coordinated international frameworks, stronger cyber governance, and improved resilience against AI-driven manipulation and attacks.

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6. POLICY IMPLICATIONS, GLOBAL GOVERNANCE, AND FUTURE TRAJECTORIES

The rapid integration of artificial intelligence into national security systems and geopolitical competition presents urgent policy challenges that extend beyond individual states and require coordinated global responses. As AI becomes more deeply embedded in military, intelligence, and cybersecurity infrastructures, the need for effective governance frameworks becomes increasingly critical to prevent instability, escalation, and misuse. A primary policy concern is the absence of comprehensive international regulation governing the military use of AI. Unlike nuclear weapons, which are governed by formal treaties and non-proliferation regimes, AI-based systems particularly autonomous weapons and cyber capabilities lack binding global agreements. This regulatory gap creates uncertainty in international relations, as states develop and deploy advanced AI systems without shared standards for accountability, transparency, or ethical use. The lack of consensus on definitions, thresholds, and permissible applications further complicates efforts to establish global norms.

Another major governance challenge is the risk of strategic instability caused by rapid technological advancement. AI systems significantly reduce decision-making timeframes in military and security contexts, increasing the possibility of misinterpretation, accidental escalation, or automated responses to perceived threats. In high-pressure geopolitical environments, especially where rival states possess comparable AI capabilities, this speed advantage may increase the risk of conflict escalation rather than deterrence. As a result, policymakers face the challenge of balancing technological advantage with stability and risk management. Global inequality in AI capabilities also has important policy implications. Advanced economies with strong research ecosystems, computing infrastructure, and data access are positioned to dominate AI development, while developing countries risk long-term dependency on foreign technologies. This technological divide may translate into broader geopolitical asymmetries, limiting the strategic autonomy of less advanced states. Addressing this imbalance requires international cooperation in technology transfer, capacity building, and equitable access to digital infrastructure.

In response to these challenges, several governance approaches have been proposed. These include the development of international AI ethics frameworks, export controls on sensitive technologies, transparency requirements for military AI systems, and multilateral agreements on autonomous weapons regulation. Additionally, there is growing emphasis on “human-in-the-loop” or “human-on-the-loop” models in military AI systems to ensure that human judgment remains central in high-stakes decisions. Another important direction is the development of AI safety and assurance mechanisms. These include algorithmic auditing, robustness testing, adversarial simulation, and continuous monitoring of deployed systems. Such mechanisms are essential for ensuring that AI systems used in national security contexts operate reliably and do not produce unintended or harmful outcomes.

Looking forward, the trajectory of AI in global security is likely to be shaped by intensifying competition, rapid technological innovation, and evolving governance structures. States will continue to invest heavily in AI capabilities to maintain

strategic advantage, while simultaneously seeking to shape international norms in their favor. This dual dynamic of competition and regulation will define the future of global security architecture. Ultimately, the intersection of artificial intelligence, national security, and geopolitical competition represents a fundamental transformation in international relations. The way states manage this transition will determine whether AI becomes a stabilizing force that enhances security cooperation or a destabilizing factor that intensifies global rivalry.

7. CONCLUSION

Artificial intelligence has become a defining force in the transformation of national security systems and the intensification of geopolitical competition in the twenty-first century. Its integration into military operations, intelligence analysis, cybersecurity, autonomous systems, and information warfare has fundamentally altered how states assess threats, project power, and maintain strategic advantage. AI has shifted security paradigms from traditional human-centered models toward data-driven, automated, and predictive systems that operate at unprecedented speed and scale. The analysis in this paper demonstrates that AI provides significant strategic benefits for national security, including enhanced intelligence processing, improved surveillance capabilities, stronger cyber defense mechanisms, and more efficient decision-support systems. These advancements enable states to respond more rapidly and accurately to emerging threats while optimizing defense and security operations. However, these benefits are accompanied by substantial risks, particularly in relation to ethical governance, system reliability, and escalation dynamics in high-pressure conflict environments.

At the same time, AI has intensified geopolitical competition by creating a new technological arena in which global powers compete for dominance. This competition extends beyond military applications into data infrastructure, semiconductor supply chains, algorithmic innovation, and international norm-setting. As a result, AI has become a central determinant of global influence, reshaping alliances, power hierarchies, and strategic dependencies among states. Despite its advantages, the deployment of AI in national security raises serious concerns. These include the risk of autonomous escalation in warfare, cybersecurity vulnerabilities, algorithmic bias in decision-making, lack of transparency in critical systems, and widening technological inequality between nations. The absence of comprehensive international governance frameworks further amplifies these risks, creating uncertainty in how AI will be regulated and controlled in global security contexts.

Moving forward, the future of AI in geopolitics will depend on the ability of states to balance innovation with responsibility. Effective governance mechanisms, international cooperation, and ethical safeguards will be essential to ensure that AI technologies contribute to global stability rather than increased conflict. Maintaining human oversight in high-stakes security decisions will remain a critical requirement for preventing unintended consequences. In conclusion, artificial intelligence

represents both an opportunity and a challenge for global security. While it enhances national defense capabilities and reshapes geopolitical competition, it also introduces complex risks that demand careful regulation and strategic foresight. The trajectory of AI development will play a decisive role in determining whether the future international system becomes more stable and cooperative or more fragmented and conflict-prone.

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